

MASSACHUSETTS WETLANDS RESTORATION NEWS

The Newsletter of the Partnership to Restore Massachusetts Wetlands

Wetlands Restoration & Banking Program
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Wetlands Restoration and the Massachusetts Watershed Initiative

Massachusetts has a proud history of preserving its wetlands. The state passed the first wetlands protective legislation in the nation in the early 1960s and Massachusetts remains a leader in wetlands protection with progressive regulations and the new riverfront protection provisions. The Riverfront Protection Act of 1996 was just one of several important steps towards an ecosystem approach to protecting aquatic resources. Within the last several years the Executive Office of Environmental Affairs (EOEA) has initiated the Massachusetts Watershed Initiative (MWI), an integrated approach to protecting our river systems and the lands that drain to them.

The MWI works to break down barriers between state environmental agencies, municipalities within a river basin, and transportation and community development agencies. The MWI builds the local ability to protect water resources and associated habitat, so that limited state, federal, municipal, and private sector resources are focused on the areas where the greatest protection and restoration of water resources will occur. Working with diverse teams, present and future threats to water resources are assessed and agreement is reached on the most important steps to take. By pooling resources and focusing on the top priorities first, significant progress can be made.

Using a watershed-based approach to restoring wetlands that have been destroyed and degraded, the Wetlands Restoration & Banking Program (WRBP) is one of many programs that support the MWI. Bringing wetlands restoration under the MWI umbrella has required close coordination with watershed teams and has great potential for improving watershed resource management overall.

WRBP continues to learn valuable lessons from its wetland restoration activities in the Neponset River watershed regarding integration within the MWI. In the Commonwealth's delineation of major watersheds, the Neponset River is part of the Boston Harbor Watershed along with the Mystic, Weir, Fore, and Back Rivers. Rich Kleiman, formerly with the MDC Planning Department, is the Boston Harbor Basin Team Leader. His role, like that of the nineteen other basin team leaders appointed last spring, and this is not an overstatement, is to coordinate all of the public and private efforts to manage the natural resources of this large drainage area. This includes monitoring water quality throughout the watershed, exploring opportunities to improve fish passage, promoting open space protection, evaluating land use management practices, addressing stormwater management, tackling low flow issues, restoring wetlands, and much more. Rich has been the primary force behind efforts to restore salt marsh at the MDC Neponset Marshes Reservation, a project he began while he was still with the MDC.

In developing a wetlands restoration strategy for the Neponset, WRBP worked closely with Rich and other members of the basin team. Wetland restoration goals for the Neponset River watershed, developed by WRBP in cooperation with the watershed community, include: 1) improving water quality, 2) improving flood storage, 3) improving fish and wildlife habitat, 4) improving groundwater recharge and stream baseflow, 5) restoring salt marshes, 6) addressing invasive species issues, and 7) restoring cold water fisheries. In a *Draft Neponset River Watershed Wetlands Restoration Plan* currently circulating for public comment (See separate article), WRBP has identified the 65 priority wetland restoration sites, out of a total of 171 sites, that can help address these goals. Making this information available in a published plan makes it possible for members of the
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Boston Harbor Watershed Team who are working on specific Neponset River watershed issues, such as improving water quality in a specific reach or increasing cold water fisheries habitat, to incorporate wetland restoration into their strategies.

But WRBP's role goes one step further. The MWI is more about action than it is about planning. Planning is useful only to the extent that it provides the information necessary for decision making and helps people agree on an action strategy. In watershed wetlands restoration planning, WRBP assembles the necessary data and uses it to help people determine how restoring wetlands can contribute to watershed improvement. Then WRBP facilitates the implementation of individual restoration projects. Through its GROWetlands Initiative, WRBP can help local projects receive funding and other assistance from its federal partners. This process exemplifies what the MWI is all about - local action to benefit the watershed's natural resources supported by state and federal, public and private, resources.

Bob O'Connor, EOEa Watershed Team Leader
Christy Foote-Smith, WRBP

1998 Wetlands Restoration Awards

On May 30, at the 1998 Wetlands Restoration Conference, the Partnership To Restore Massachusetts Wetlands presented five well-deserved Massachusetts Wetlands Restoration Awards. Congratulations are due to the following award recipients:

Ruth Alexander, for her galvanizing leadership role in protecting and restoring the 1500-acre Great Marsh on the North Shore of Massachusetts.

Elizabeth Duff, Education Director for the Massachusetts Audubon Society's North Shore Office, for her creative and worthwhile efforts to educate middle school children about salt marshes.

Eight Towns and The Bay, the Massachusetts Bays Program local governance committee for Amesbury, Salisbury, Newburyport, Newbury, Rowley, Ipswich, Essex, Gloucester, and Rockport, for its exemplary

efforts to identify and restore salt marshes and to educate the public about the importance of this precious natural resource.

Parker River Clean Water Association, for its efforts to identify and restore tidally restricted salt marshes and to educate and mobilize citizen involvement in this important work.

Dr. John Teal, for his lifelong contribution to the study and understanding of salt marshes and salt marsh restoration.

Neponset Wetlands Restoration Plan Under Public Review

A *Draft Neponset River Watershed Wetlands Restoration Plan* has been released by WRBP and is under public review until February 12, 1999. The *Draft Plan* identifies and describes 171 potential wetland restoration sites. Of these, 65 are considered highest priority for promoting the restoration goals adopted by the watershed community, which are:

- * improve water quality
- * improve flood storage
- * improve fish and wildlife habitat
- * restore salt marshes
- * address invasive species issues
- * improve cold water fisheries
- * improve groundwater recharge and stream baseflow

WRBP will present the plan to the watershed's conservation commissions and is holding two public meetings in January. For a copy of the *Draft Plan* and information on the public meetings, call WRBP at (617) 727-9800 x213.

Salt Marsh Restoration Begins at Joppa Flats

The Massachusetts Audubon Society is very pleased to report that it has begun salt marsh restoration at its Joppa Flats site on the Merrimack River in Newburyport. The objective of this ambitious project is to transform badly degraded wetlands and a portion of upland into very productive salt marsh habitat.

This fall, our contractor (Great Meadow Farm) has begun to remove fill and invasive plant species (e.g., Japanese Knotweed and Common Reed) from our site. They will also begin construction of three salt pannes and a tidal creek. The pannes (small pools) will be located at different elevations within the restored salt marsh to create different salinity levels and inundation
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periods – differences that will encourage the development of slightly different plant and animal communities. The creek will restore tidal flow to the area. In the spring, we will complete construction of the pannes and replant the salt marsh and coastal bank with native plant species.

The Massachusetts Audubon Society is currently raising funds to build a visitors center on the Joppa Flats site. The combination of restored salt marsh and visitors center will make the Joppa Flats site an important natural history destination – a place from which Massachusetts Audubon can pursue its mission of advocacy, education, and conservation. With annual traffic flow past the site estimated to be 1.6 million vehicles, Joppa Flats will be an excellent venue from which to conduct community outreach programs on the value of salt marshes and strategies for restoration. We also expect that on-going monitoring by scientists of the Massachusetts Audubon Society will provide valuable insight into salt marsh restoration efforts—information that can be shared with other agencies.

The Massachusetts Audubon Society is very grateful for all of the support it received during the permitting process. The Massachusetts Wetlands Restoration & Banking Program played a key role by providing technical support, help with proposal writing, and encouragement. The U.S. Army Corps of Engineers conducted many on-site visits to review our plans. National Marine Fisheries Service and EPA provided excellent support. The U.S. Fish and Wildlife Service contributed expertise and funding. This has been a very rewarding team effort. Due to the review and permitting process, the final salt marsh restoration plan submitted by Massachusetts Audubon is significantly better than our original conceptual design.

For additional information, please contact Bill Gette, Sanctuary Director, at (978) 462-9998.

Bill Gette
Massachusetts Audubon Society

NEW FROM WRBP!! ***Wetlands Kit for K-12 Educators***

WRBP developed this “idea kit” to encourage K-12 teachers to bring the wonderful world of wetlands to their classrooms and to bring their students to the wonderful outdoor classrooms that wetlands can provide. Conservation commissions are encouraged to present the Kit to their local schools. To request a copy call WRBP at (617) 727-9800 x213.

State’s First Self-Regulating Tidegates Installed in Revere

The first Waterman/Nekton Self-Regulating Tidegate (SRT) for Massachusetts was installed by the City of Revere in Rumney Marsh in October 1997. This new technology tidegate has restored a muted tidal hydrology to approximately 24 acres of salt marsh associated with the Central County Ditch. The marsh had become dominated by *Phragmites australis* due to a standard flapper tidegate constructed in 1953. However, the flapper broke during a northeaster in October, 1996, and, with this increased tidal flow, the wetland has been restoring itself to salt marsh. A new tidegate was needed, however, for this flood-prone area.

The SRT was selected because it allows regular tidal flushing of the marsh, necessary to maintain a coastal wetland plant community, but prevents higher flood tides from entering. Due to a bottom float arrangement, the Waterman/Nekton Self-Regulating Tidegate floats open with an incoming tide. When the tide reaches a pre-set level, the floatation against the top float forces the tidegate to close, excluding flood tides and preserving interior flood storage in rain events. The SRT can be manually closed, if necessary, prior to expected storms.

About ten acres of *Phragmites* died off during the year when no tidegate existed and the site was supersaturated with saline waters. Remaining areas of *Phragmites* are stunted in height due to salt water stress on the plant. After the first growing season with the SRT functioning, most of the bare areas vegetated with *Salicornia* which typically pioneers in coastal restoration sites.

Six more SRTs will be installed in 1999 by MassHighway for approximately ten acres of salt marsh affected by broken and missing tidegates between the Pines River, Route 1A, and Revere Beach. Three additional SRTs will be constructed by MassHighway at Town Line Brook, another tributary to Rumney Marsh in Revere. This tidegate retrofit will preserve approximately five acres of intertidal mudflat and salt marsh habitat upgradient of the existing, leaking structures.

This will make a total of ten SRTs at Rumney Marsh. These SRTs will allow salt marsh restoration and preservation where ordinary repair or replacement of the former broken, leaking, or missing tidegates with standard one-way tidegates would have resulted in additional salt marsh losses and increased *Phragmites* growth. About 40 acres of estuarine habitat is affected by these ten tidegates.

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The City of Revere is interested in installing one more SRT to restore salt water and provide flood control at a salt marsh affected by a standard tidegate under the MBTA rail embankment. Efforts also are underway to evaluate use of this technology at the Ballard Street Salt Marsh in Saugus. This technology was first introduced in Connecticut some twenty years ago, and four SRTs were installed at the Galilee Bird Sanctuary in Galilee, Rhode Island, in 1998.

We are very proud of the efforts and results in Revere and in Rumney Marsh. These first SRT installations in Rhode Island and Massachusetts will be watched with great interest by other states as the capability of this innovative technology demonstrates that both salt marsh restoration and flood control benefits can be provided wherever standard flapper tidegates have adversely affected salt marshes.

As a footnote, the City of Quincy installed the first electric automatic sluice gates (a different technology) to restore Massachusetts salt marshes. Quincy has three of these tidegates in place and Winthrop has one. The Waterman/Nekton SRT operates by floats and gravity and requires no electricity.

*Ed Reiner
EPA Region I*

Planning for Wetlands Restoration in the Upper Blackstone River Watershed

The Worcester County Conservation District (WCCD), in cooperation with the Wetlands Restoration & Banking Program (WRBP) and the University of Massachusetts Amherst (UMass), is preparing an *Upper*

Blackstone River Watershed Wetlands Restoration Plan.

This project has been financed partially with Federal Funds from the Environmental Protection Agency (EPA) to the Massachusetts Department of Environmental Protection (DEP) under a S.604(b) Water Quality Management Planning Grant.

The objective of the project is to improve the wetland resources in the Upper Blackstone watershed by developing a watershed wetlands restoration plan that is technically sound and enjoys public support. By emphasizing public participation during the planning process, it is hoped that the recommendations of the plan will be implemented. At the completion of the planning process, potential wetland restoration sites will be identified and a watershed wetlands restoration plan will be prepared for the Upper Blackstone watershed, which includes part or all of the communities of Auburn, Boylston, Grafton, Holden, Leicester, Millbury, Paxton, Shrewsbury, Sutton, Westborough, West Boylston and Worcester.

The plan will be developed in accordance with the technical and planning criteria of WRBP. WRBP will oversee preparation of the wetlands restoration plan and act as liaison to UMass. WCCD will manage the project overall and, in cooperation with WRBP, will take primary responsibility for conducting an outreach and education strategy. The technical analysis of the watershed will be performed by the Natural Resources Assessment Group (NRAG), Department of Plant & Soil Sciences, UMass with support from the U.S. Fish & Wildlife Service.

The technical analysis of the planning area will identify potential wetland restoration sites that can contribute to improving the watershed's water quality, flood storage capacity, stream baseflow, groundwater recharge, and fish and wildlife habitat. Components of the technical analysis include aerial photointerpretation to update National Wetlands Inventory map information and identify potential wetland restoration sites; creating a wetlands database for the watershed; producing quality wetlands maps for area communities; evaluating watershed-level functional deficits for the Upper Blackstone; and a site-by-site assessment of potential restoration sites over one acre in size. Results of the technical analysis will be used to prepare an *Upper Blackstone River Watershed Wetlands Restoration Plan.*

An educational brochure on wetlands restoration and planning will be developed for distribution, and a standup display about wetlands restoration will be placed in libraries and town halls on a rotating basis in Upper Blackstone watershed communities. Also, a "Wetlands [*Continued on next page.*]

Kit for K-12 Educators” will be mailed to any interested watershed teachers. Special events, such as wetlands walks, will be scheduled.

Throughout the planning process, public meetings will be scheduled with key groups and agencies to explain the planning process, involve stakeholders, and receive information so that they may be able to contribute to the plan. These groups include, but are not limited to, the Blackstone River Basin Team, conservation commissions, stream teams, environmental, and other community groups. The project is expected to be completed in eighteen months.

For more information, contact: Bonnie Booth, WCCD at (508) 829-0168 x5 (e-mail - divfour@aol.com) or Christy Foote-Smith, WRBP at (617) 292-5991 (e-mail - christy.foote-smith@state.ma.us).

*Bonnie Booth
Worcester County Conservation District*

Construction Completed at Argilla Road Restoration Site

The National Marine Fisheries Service hosted an on-site dedication ceremony on Friday, November 13, to mark the return of historic tidal flow for the first time this century to the Argilla Road salt marsh near Crane’s Beach in Ipswich. On the same day, partners in the project completed the replacement of a 32-inch culvert under Argilla Road with an 8-foot by 5-foot concrete box culvert. The smaller culvert, in place for decades, restricted tidal flow and reduced the portion of the marsh that is regularly flooded. Opening of the new culvert immediately allowed increased tidal flow into an approximately 20-acre area and is expected to enhance the habitat value for a variety of marine species.

Workers from the Ipswich Department of Public Works began removing the old culvert on the previous Monday

and, after tackling five days of logistical impediments, successfully completed the project in a timely and effective manner. Impediments during the week of installation included no-work periods during high tides, late delivery of culvert sections, and the Veterans Day holiday in the middle of the week. Under the supervision and management of Ipswich DPW Director Armand Michaud, quick acting contingency plans ensured completion in the expected one week time frame.

This restoration project is a joint effort of public agencies and private organizations, including the National Marine Fisheries Service and The Trustees of Reservations, the private non-profit organization that owns the 20-acre marsh. Other partners include the Town of Ipswich, Massachusetts Wetlands Restoration & Banking Program, and the Fish America Foundation.

Extensive pre-construction monitoring of baseline hydrology, fisheries, and vegetation was completed during 1997 and 1998. Post-construction monitoring will begin immediately. For more information about this project, please contact Eric Hutchins (978) 281-9313 or John Catena (978) 281-9251.

*Eric Hutchins
National Marine Fisheries Service*

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Credits: Masthead logo is by Mara Biasi. The graphic on page 2 is by Thomas Ford, Courtesy of Tip of the Mitt Watershed Council, Michigan. The graphics on pages 4 and 11 are by Dan Dailey.

Partnership to Restore Massachusetts Wetlands Coordinating Committee:

Executive Office of Environmental Affairs
Executive Office of Transportation & Construction
Natural Resources Conservation Service
Environmental Protection Agency
U.S. Army Corps of Engineers
National Marine Fisheries Service
U.S. Fish & Wildlife Service
Federal Highway Administration
Massachusetts Association of Conservation Commissions
Massachusetts Audubon Society

Effectiveness of Compensatory Wetland Mitigation in Massachusetts

Following the recommendations of the Wetland Banking Advisory Council, WRBP commissioned a study of current wetland mitigation practices within the Commonwealth. The study was conducted during the summer of 1997 by the University of Massachusetts, and the final report was recently released.

The study analyzes a representative sample of wetland replication projects selected from a random sample of 44 towns in Massachusetts. The study examined losses of wetlands that occurred from failures of compensatory mitigation at authorized wetland impact sites, but did not address losses from other causes such as unmitigated Limited Projects and unauthorized fills. Analysis was completed for 391 project files identified in the study period between 1983 and 1994, and 114 site visits were conducted. Data were collected on project size, location, status, and detailed comparisons of replicated plant communities were made with remnant impacted wetlands when these existed.

Most projects in the study were relatively small, impacting less than 5,000 square feet of wetland. The majority of projects (54.4%) were not in compliance with the requirements of the wetland regulations for a variety of reasons including no attempt to build the project, insufficient size or hydrology, or insufficient cover of wetland plants. Many of the projects that were constructed were smaller than required by their Orders of Conditions (64.9%). The majority of constructed projects involved impacts to forested wetlands (70.1%), but most replication projects were designed to produce scrub/shrub systems (61.4%), and most actually produced either no wetland (38.6%), open wet meadows (36.8%), or some other wetland type.

The plant communities produced at replication sites differed significantly from the wetlands they were designed to replace, in terms of number of species, cover, and species composition. The similarity of the replication site plant communities does not increase between projects that are new and projects up to 12 years old, indicating that similar plant communities may not be replaced at most sites for many years if at all. The completeness of the replication plan and the Order of Conditions affect the likelihood that a project will comply with the regulations, but not the level of similarity between the replicated and impacted plant communities.

Projects constructed under variances from the Wetland Protection Act were much more carefully designed, and were all in compliance with the regulations. However, they also had plant communities that were not similar to those of the impacted wetlands they were designed to replace. They generally provided very good replication of water quality and sediment control functions, but not of wildlife habitat functions.

Recommendations for both local Conservation Commissions and the Commonwealth of Massachusetts were provided to address the problems described in the study.

Stephen Brown
Manomet Center for Conservation Sciences

Note: Copies of the wetlands mitigation study may be obtained by calling WRBP at (617) 727-9800 x213.

WRBP Mitigation Study: Next Steps

In response to the recommendations of this study, WRBP will be working with Dr. Stephen Brown through the University of Massachusetts Amherst to produce a mitigation guidance document for DEP and to conduct training for conservation commissions and DEP staff.

GUEST EDITORIAL:
Perceptions of Wetland Restoration
Surprise Linkages with Replication Failures

Several years ago I informed a conservation commission that grant monies were available for pilot restoration projects on filled wetland areas. The chairman shrugged and said, "So what? All they'd be doing is making a bunch of cattails. At least we have trees there now..." This comment, more than any pontificating, illustrates the perceived linkage between decades of failed wetland replication and present and future attempts to restore wetlands.

Wetland replication has rightly earned its poor reputation. Conservation Commissions across the state look with skepticism at proposals to replace lost wetlands with created wetlands. Their skepticism arises from direct experience. Consultant upon consultant has come before them, glowingly describing replication proposals. Actual construction of these areas, which we artfully call "replications," is almost always deficient. The majority of replications have failed, and each failure is a measurable wetland loss for the Commonwealth.

The Wetland Protection Act requires certain levels of
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mitigation to occur when wetlands are impacted, but technical guidance regarding replication methodology within the legislation is minimal. In addition, DEP has previously issued replication guidance sufficiently vague to allow forested wetlands to be replaced with cattail meadows, and shrub swamp wetlands to be replaced with odd pockets of soft rush and loosestrife. This pattern of inept replacement is well documented in the recent Brown and Veneman *Compensatory Wetland Mitigation in Massachusetts* study (September 1998) (See preceding article). Bad science, careless construction, basic misunderstandings, and inadequate supervision have all contributed to the long history of these failures.

The wetland regulatory and consultant community knows this, both from specific examples and anecdotally. The biochemical, biological, and habitat values of a forested wetland swamp are vastly different than those of a monocultural wetland meadow. And because we have allowed what I mindfully call “junk replications” to prevail, there is a strong negative linkage between replication and restoration. In fact, the two words are similar enough that they are frequently used interchangeably.

We should acknowledge that wetland replication and restoration, particularly for inland wetlands, will likely be perceived in the future, as they are now, as identical terms or techniques. The success of one will assume the success of the other. The driving scientific principles of successful wetland replication are identical to those for restoration, so this public perception itself is reasonable.

What is the effect of this linkage? Clearly, as EOEА moves toward broader implementation of wetland restoration, public education becomes a priority. Hand in hand, wetland scientists must continue to refine techniques to insure consistently successful like-kind replications and restorations of inland wetlands.

The good news is that many of us in the wetland science community believe that the technical knowledge does exist to largely restore wetlands to their original kind. There are excellent scattered examples of successful replications in Massachusetts and throughout New England. Scientific understanding has advanced dramatically in the last five years. The best wetland specialists now understand how to create or recreate outstanding wetland areas. They understand why the previous failures occurred, and how to avoid them. Regulators are also becoming increasingly savvy during review and supervision of wetland replication projects.

Regardless, the scientists, designers, and regulators with this knowledge remain in the minority.

Consequently, regulatory standards for replication must be higher. The issuance of a detailed DEP Wetland Replication cookbook on par with the recent DEP Stormwater Management handbook (March 1997) would institute such standards. Similarly, systematic and consistent supervision of replication must always occur. Implementation of the recommendations in the Brown and Veneman *Compensatory Wetland Mitigation in Massachusetts* study would further insure a higher success ratio.

If wetland impacts continue to be allowed by regulation, they should be mitigated in all respects. If wetland restoration is to become widespread, its success, too, will be dependent on educational efforts, proper project implementation, and subsequently thriving wetland recreations.

I suggest that a year 2000 goal for the Commonwealth of Massachusetts would be to strive for a 100% success rate of all future wetland replications in the ensuing century. The science exists to achieve that goal. And that level of mastery would truly eliminate controllable wetland losses, and would allow the movement for wide-scale restoration to rapidly gain momentum.

Patrick C. Garner

Patrick C. Garner is a wetland professional who has been practicing in the field since 1977. A private consultant and contributor to technical publications, he is a past President of the Association of Massachusetts Wetland Scientists, a current Director of the Massachusetts Association of Conservation Commissions, and a member of the EOEА Wetlands Banking Advisory Committee.

Note: The opinions expressed in the preceding article do not necessarily reflect those of the Executive Office of Environmental Affairs or the Partnership To Restore Massachusetts Wetlands.

Editorial articles on topics related to wetland restoration, and letters of comment on the articles published in this newsletter, are welcomed. They may be submitted to: Christy Foote-Smith, WRBP, c/o DEP, One Winter Street - 5th Floor, Boston, MA 02108, and will be published at the discretion of WRBP.

Rumney Marshes ACEC Getting Its Own Wetlands Plan

For the past year, an interagency task force of federal, state, regional, and local agency representatives has been working towards wetlands restoration in the Rumney Marshes Area of Critical Environmental Concern (ACEC). This 2800-acre ecosystem, located in Revere, Saugus, Lynn, Boston, and Winthrop encompasses the largest remaining salt marsh system along Boston Harbor. The task force is working in coordination with the WRBP and is facilitated by the ACEC Program at the Department of Environmental Management. A database of over 30 sites of potential, existing, and completed wetland restoration areas is being prepared, with mapping and text descriptions.

Local public meetings and distribution of a preliminary report to invite comments and input are anticipated for this winter. A wetland restoration plan for the ACEC will then be drafted. Several wetland restoration projects are currently underway, and future projects will be prioritized for potential funding and action. The plan will also address local, state and federal coordination, project monitoring, and overall preservation and management of the wetland resources of the ACEC. For further information please contact Elizabeth Sorenson, ACEC Program, at 617-727-3160, ext. 552.

*Liz Sorenson
ACEC Program*

Eight Towns & The Bay Update

The Eight Towns and The Bay Committee (8T&B), a regional coastal group, has recently entered into a partnership with WRBP and several federal agencies. This collaboration will bring funding and technical support to local officials, for local road improvement projects that will result in salt marsh restoration. The Partnership to Restore Massachusetts Wetlands, in cooperation with 8T&B, is seeking nominations for projects in the communities of Salisbury, Newburyport, Newbury, Amesbury, Rowley, Ipswich, Essex, Gloucester, and Rockport. Eligible projects are roads that cross tidal creeks where the culvert or bridge structure is restrictive to tidal flow. Increasing the size or elevation of a culvert or size of a bridge opening may result in restoration of salt marshes upstream.

The following agencies have offered support to selected projects: US Fish and Wildlife Service, WRBP, Natural Resources Conservation Service (NRCS),

Environmental Protection Agency (EPA), National Marine Fisheries Service (NMFS), 8T&B, and the Northeast Massachusetts Mosquito Control and Wetland Management District. The agencies will provide a combination of funding for construction materials, technical assistance, permit assistance, and other project support.

This salt marsh restoration initiative follows on the heels of several tidal restoration projects in the 8T&B region. A 1997 report, commissioned by 8T&B and carried out by the Parker River Clean Water Association, inventoried over 125 tidal crossings in the 8T&B region. Sites that appeared to have significantly impeded tidal flow (over half of those inventoried) were identified and brought to the attention of local municipal officials. 8T&B is working with local officials on an ongoing basis to address these sites, and is currently coordinating projects on Conomo Point Road in Essex and at Long Wharf in Gloucester.

8T&B is also involved in educational efforts to raise public awareness of the importance of salt marshes. If you are driving around the region, you might notice green educational displays which highlight the importance of salt marshes. These displays were designed by 8T&B and eleven were installed in 9 communities. Next spring, 8T&B will be taking part in a pilot volunteer training program for assessing wetland health. This program will be conducted by University of Massachusetts Extension Service using assessment techniques developed by Massachusetts Coastal Zone Management and others. The long-term goal is to expand this volunteer monitoring program throughout the state, with the information gathered by volunteers helping to inform management decisions for wetlands protection and restoration.

8T&B is cosponsored by Merrimack Valley Planning Commission and the Massachusetts Bays Program (MBP). The Committee, made up of appointed representatives, works to promote protection of the area's coastal resources, by providing technical assistance to communities and supporting local research and education projects. To find out more, call (978) 374-0519 or check their web page at: www.thecompass.com/8TB.

*Victoria Boundy
8 Towns & The Bay*

Wetland Restoration News Briefs

Coastal Wetland Restriction Orders Not a Barrier to Wetlands Restoration

In the last *Massachusetts Wetlands Restoration News*, it was reported that the language in many coastal wetland restriction orders, adopted under the Coastal Wetland Restriction Act (MGL C.130, s.105) and recorded at applicable Registries of Deeds, appeared to prohibit the substantial alteration of tidal flow. A large increase in tidal flow is often required to restore the natural hydrology to salt marshes that supports natural salt marsh vegetation and discourages invasion by *Phragmites australis*. In order to proceed with restoration at such sites, it appeared that new orders would have to be adopted that specifically allowed the restoration work.

Upon evaluation of the orders, DEP determined that they would apply only to restricted wetlands where the work was to be performed and not to wetlands where no work would occur, even if the hydrology would be altered as a result of the work. Since most of the projects thought to be at risk involved culvert replacements outside of the restricted wetlands, this ruling allowed these projects to move forward unaffected by the deed restrictions in currently in place.

The only proactive salt marsh restoration project to date that has been impacted was Joppa Flats in Newburyport (See separate article). WRBP, acting on behalf of DEP, assisted Massachusetts Audubon Society, the project proponent at Joppa Flats, in receiving DEP approval and recording a new restriction order that has allowed restoration work to proceed at the site. The process took about three months. Since this process can be carried out while other permits are sought, new restriction orders at future restoration sites, if required, need not slow projects down.

Connecticut River Watershed Wetlands Restoration Planning

WRBP will be preparing a watershed wetlands restoration plan for certain watersheds on the west bank of the Connecticut River. The project area includes the watersheds of the two Mill Rivers and the Manhan River in all or parts of Westfield, Montgomery, Huntington, Westhampton, Easthampton, Holyoke, Northampton, Southampton, Williamsburg, Goshen, Whately, Conway, Deerfield, and Hatfield. Under a Section 22 Planning Assistance to States Grant, the Army Corps of Engineers

will gather information and prepare a technical report locating and describing potential wetland restoration sites and will evaluate existing information regarding watershed problems such as water pollution, flooding, loss of fish and wildlife habitat, low stream flows to determine where wetlands restoration can be used to help improve the watershed. Based on this data, WRBP will work with watershed communities to develop and implement a wetlands restoration strategy.

GROWetlands Grant Program Launched

This fall, WRBP launched the GROWetlands Grant Program. A Request For Responses was issued and a number of proposals were received. WRBP will announce distribution of up to \$100,000 in grants to support the implementation of wetland restoration projects in early February 1999. Although this year's application deadline has passed, it's not too early to begin planning projects for Fall 1999 grant applications. For a copy of the 1998 RFR to use as a guideline, call WRBP at (617) 727-9800 x213.

Updated Grant List Available

WRBP has updated its list of state and federal government grant programs that support wetlands restoration planning and project implementation. To receive a copy, call WRBP at (617) 727-9800 x213.

Barlows Landing Restoration Work Finished

Construction has been completed at the Clifford R. Wise Causeway on Saltmarsh Lane in Bourne and hearty congratulations are due to Neil Andres, Superintendent of the Bourne Department of Public Works. WRBP trusts that his efforts to design, permit, and manage the replacement of an undersized 48"-diameter pipe culvert with a 6' x 8' box culvert will serve as a model of municipal/state cooperation throughout Cape Cod and Buzzard's Bay communities.

The replacement of this culvert has dramatically improved tidal interchange in a 15-acre section of salt marsh between Hen Cove and Pocasset Harbor. A recent site inspection by EPA, NMFS, and WRBP staff disclosed a solid, well-constructed project incorporating not only the larger culvert but some much-needed safety improvements as well. While long-term monitoring will be necessary to document the ultimate results of this effort, numerous local residents have commented favorably on the immediate visible and olfactory improvements brought about by the project.

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Not content to rest on his laurels, Neil has submitted three additional Bourne projects for consideration, including re-establishment of tidal flow from Hen Cove to the Barlows Landing area. This option would continue to improve the Barlow's Landing salt marsh system. Additional projects at Wing's Neck and the Mashnee Dike are also under review. We look forward to continued success in the restoration of Bourne's salt marsh resources and expansion of WRBP's coastal projects throughout southeastern Massachusetts.

New GROWetlands Projects

Throughout 1998, WRBP has had a flurry of GROWetlands (Groups Restoring Our Wetlands) project nominations submitted for consideration and GROWetlands Agreements signed. Happily, we are able to report that, at this writing, four additional projects have been accepted under the GROWetlands Initiative and are now eligible to receive additional support under the *Resolution To Restore Massachusetts Wetlands*, a Coastal America Partnership agreement.

Sagamore Marsh Restoration Bourne & Sandwich

As a major and on-going project between the Massachusetts Executive Office of Environmental Affairs (EOEA) and the US Army Corps of Engineers, WRBP is very pleased to accept a GROWetlands Nomination from the Corps for this 50-60 acre salt marsh restoration project. The project involves enhancement of tidal flushing throughout an extensive salt marsh behind the popular Scusset Beach at the eastern end of the Cape Cod Canal in Bourne and Sandwich.

The Corps' design plans have been finalized, with last-minute modifications to protect rare wetland wildlife habitat, and the MA Department of Environmental Management, as non-federal sponsor of the project, is proceeding with the required permitting for the project. Orders of Conditions have been received from both the Bourne and Sandwich Conservation Commissions and applications for Water Quality Certification, Ch. 91 licensing, and Coastal Zone Consistency review have been submitted. At present, DEM and the Corps are working to put the project out to bid in early 1999 and begin construction on this important project next spring.

Conomo Point Essex

In contrast to the Sagamore Marsh restoration project, undertaken by a federal agency and sponsored by EOEA, the Conomo Point project is championed by local volunteers. Identified by Derek Brown, a professional environmental consultant, WRBP volunteer, and Essex resident, the Conomo Point project also involves improvement of tidal flushing in a degrading salt marsh. This 2-acre project is located along Conomo Point Road, at the extreme landward edge of the Parker River Area of Critical Environmental Concern.

With the active support of the Eight Towns & The Bay Committee, represented in Essex by Derek and Stephan Gersh, WRBP has secured the participation of the USDA's Natural Resources Conservation Services (NRCS). The NRCS has performed field survey work and has recently completed a hydrologic and hydraulic analysis of culvert replacement alternatives in this sensitive area. WRBP also coordinated an important pre-application site inspection with representatives of the, NMFS, and the MA DEP Wetlands & Waterways Program (NERO). With the identification of critical site constraints and preparation of a conceptual restoration strategy, the project is ready to move on to final design and permitting. Pending receipt of permits, the first phase of the project, replacement of the existing undersized culvert under Conomo Point Road, is scheduled to be performed by the Town of Essex Department of Public Works in the spring of 1999.

"Damde Meddowes" Worlds End, Hingham

WRBP is pleased to have signed a GROWetlands Agreement with The Trustees of Reservations for the site at World's End in Hingham known as Damde Meddowes. This historic title dates from the seventeenth century when early settlers built a dam or causeway across this former salt marsh to "reclaim" the area from the sea. This exciting project involves the restoration of what may be one of the oldest restricted salt marshes in New England!

The Trustees have put together a multi-disciplinary team of individuals and agency staff to assess the existing conditions and to prepare a set of alternatives for the control of invasive *Phragmites australis* at the site. While the full suite of project goals has not yet been finalized, it appears that restoration of tidal flow to the Damde Meddowes will be a part of the vegetation

management strategy. NRCS has recently completed *Continued on next page.*
additional field survey, building on the extensive work done by a team of faculty and students from Curry College, to document tidal hydraulics in the area, and is presently preparing an analysis of flow restoration options. Baseline investigations of existing conditions at the site have been and continue to be undertaken by a variety of project cooperators.

Ballard Street Saugus

WRBP and the USA Environmental Protection Agency (EPA) have entered into a GROWetlands Agreement to restore approximately 20 acres of salt marsh in the Rumney Marshes Area of Critical Environmental concern. This project, in the area of Ballard and Bristow Streets in Saugus, involves restoration of tidal flows to restricted salt marshes while, at the same time, providing important flood control protection to local residents in this low-lying area. The primary salt marsh restoration activities will include repair and modernization of existing tidegates and channel improvements to deliver enhanced flows to broader, infrequently-flooded sections of this marsh.

In recognition of the complex tidal hydraulics in this area, the NRCS has drafted a thorough analysis of hydrologic and hydraulic existing conditions and potential modifications. Using the UNET simulation procedure, NRCS has developed a model for normal tidal fluctuations and for the 100-year storm tides. This analysis is currently under review by the US Army Corps of Engineers and, when finalized, will serve as the basis for the final design and project permitting. WRBP is pleased to support the long-term interest in salt marsh restoration evidenced by EPA in this unique urban estuary.

It Takes a Summit to Save a Salt Marsh

In the early 1990s, the upper North Shore of Massachusetts wasn't exactly undiscovered and it's not as if threats to its coastal ecosystems didn't exist. In recognition of the region's extraordinary expanse of salt marsh, barrier beach, and estuarine habitats, in 1979 the Parker River/Essex Bay system was designated as the state's first Area of Critical Environmental Concern (ACEC). Non-profit organizations like Essex County Greenbelt Association, Massachusetts Audubon Society, and The Trustees of Reservations, as well as the usual assembly of state agencies, established active land protection, research, environmental advocacy, and

education programs. The US Fish & Wildlife Service Parker River National Wildlife Refuge on Plum Island provided a haven for wildlife, served as a Mecca for birdwatchers, and also carried out habitat management programs. Local groups like the Ipswich Coastal Pollution Control Committee and various open space committees were assessing the status and need for environmental protection in their towns.

But somewhere between 1991 and the middle of the decade there was an explosion of interest and activity in the region that continues to this day. In 1991, Massachusetts Audubon Society, funded by the Massachusetts Bays Program, began a five-year project designed to study water quality, hydrology, land use, wildlife in the Plum Island Sound and to work with the towns of Ipswich, Rowley, and Newbury to remediate problems and develop stewardship for the ecosystem. Studies confirmed what residents and environmental professionals were already noticing. Land development was occurring at an alarming rate. Rivers and streams were suffering from pollution. *Phragmites* and purple loosestrife were replacing native fresh and salt water wetlands. The results of the research were used to develop an Action Plan for environmental protection, and a long-term management plan designed to enhance degraded habitats, improve water quality, and protect the more pristine areas from additional problems.

No sooner said than done. Even before the Action Plan hit the streets, Massachusetts Audubon was embarked on a project to improve water quality in the Rowley's Mill River watershed, working with the town highway department to install a stormwater management system and with area farmers to implement agricultural best management practices designed to improve water quality. The newly formed Parker River Clean Water Association began tackling pollution problems in that watershed. 8 Towns and The Bay was mustering support for management plan activities in coastal communities. And, salt marsh education was underway in the schools.

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In 1996, Massachusetts Audubon held the first Great Marsh Summit in order to highlight the region's wealth of natural splendors and the efforts to protect them, strengthen the obvious opportunity for collaboration on many of these projects, and emphasize the need for financial and technical assistance to achieve the goals. Participants adopted a *Blueprint for Action* to protect land, biological communities, and water quality, and formed action teams to achieve goals and objectives within each of these categories. The teams are coordinated by Massachusetts Audubon and meet regularly to discuss issues and plan for action.

The second Great Marsh Summit, held in October 1998, was a celebration of achievements and a forum to revisit and update the *Blueprint for Action* and re-emphasize the power of collaboration. Examples of success include: 1) the land protection team's assistance to the town of Ipswich resulting in permanent conservation status for over 400 acres of town-owned land and 2) the anadromous fish team's ambitious agenda for restoring the Parker River alewife run to historic numbers, a complicated task on which the team is making significant progress.

It is all too easy to study problems, make recommendations and then move on to investigate the next hot topic. Many of us have witnessed or even participated in that scenario. Our experience with the Plum Island Sound Project and the Great Marsh Summit activities demonstrates several things: 1) collaboration is necessary in order to reach complicated, long-term goals; 2) breaking down big goals into short term objectives increases a sense of success and progress; 3) participating in a collaborative project is professionally stimulating and does not threaten the identity of an individual organization or agency – there's plenty of work for every one, and a niche for all; and 4) coordinating a major collaborative effort is a huge task. But the most satisfying result is seeing the Great Marsh from Gloucester to Salisbury beginning to receive the high level of active protection that it deserves.

Kathy Leahy
Massachusetts Audubon Society

Monitoring Salt Marsh Restoration Projects

Monitoring is an essential component of any well-designed wetland restoration project. It allows one to determine if the restoration has been successful and

what modifications, if any, may need to be made. It also provides information to guide future restoration initiatives and helps to increase our understanding of how wetlands function.

While there is general agreement among scientists and managers that monitoring should be done, there are many different ways to carry it out. Just as the goals of restoration projects differ from site to site, so does the monitoring that is appropriate. Managers and scientists often disagree about how much monitoring is enough, and scientists at different sites may use different methods and measure different parameters. This limits our ability to compare results across a number of marshes.

This past summer, Massachusetts Audubon: North Shore (MAS: NS), the Gulf of Maine Council on the Marine Environment, and the Massachusetts Wetlands Restoration & Banking Program brought together New England scientists and coastal managers involved in salt marsh restoration work to begin to develop a consensus on monitoring protocols. Scientists at the workshop stressed the importance of having permanent reference sites that could be used as a basis for comparison long into the future. They also emphasized the need for setting quantitative restoration goals, monitoring over a sufficient length of time, and obtaining reliable quantitative data. Since salt marshes vary a great deal even within a small area, sampling should be based on fixed locations that can be revisited over time.

There was general agreement at the workshop that monitoring vegetation changes is basic to all salt marsh restoration projects, since the vegetational structure determines in large measure what other functions the marsh will support. Also, the major rationale for most current salt marsh restoration projects in Massachusetts is reversing the spread of the aggressive weed, common reed (*Phragmites australis*), so it makes sense to measure vegetation. Beyond vegetation, a decision on what additional parameters should be measured should be based on the goals of the restoration project (e.g., birds, if the goal is to improve bird habitat). Fish are important to monitor in many cases, but scientists at the conference cautioned that not all of the standard methods provide good quantitative information.

Massachusetts Audubon: North Shore has several ongoing salt marsh monitoring projects in the Great Marsh of northeastern Massachusetts. With funding from the Oak Knoll Foundation and the Entrust Fund, MAS:NS has been working closely with scientists from the University of New Hampshire and the National Marine Fisheries Service to develop monitoring protocols that can be widely applied. We have been

monitoring changes in the abundance of different plant species along twenty permanent transect lines spread
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throughout the salt marsh. Many of these transects are located in transitional areas between *Phragmites* and salt marsh vegetation. We have also been monitoring groundwater salinity and depth along the transects because *Phragmites* thrives in areas where the salinities have been lowered by restricting the tidal flow. Hydrological measurements have been taken at culverts under roads that are restricting water flow.

Our monitoring has included several groups of salt marsh animals. At various sites throughout the region, we have been investigating the impact of tidal restrictions on salt marsh fish using three different methods. We are likely to test a fourth method this summer. We have been comparing bird use of *Phragmites* with other marsh plant communities at sixty different counting "circles" (50 meter radius) throughout the North Shore. We play tapes of appropriate bird calls and record birds seen or heard within the circle. Insects and marine invertebrates have also been examined.

One site of particular interest within the Great Marsh is along Argilla Road in Ipswich. A joint project involving the National Marine Fisheries Service, MAS:NS, The Trustees of Reservations, the Town of Ipswich, and the Fish America Foundation has resulted

in the replacement this past fall of a culvert that was restricting tidal flow to this marsh. We expect that this will cause a dramatic reduction in *Phragmites* and increase the overall acreage of wetlands. In preparation for the restoration, two years ago we set up a series of vegetation transects in both the tidally restricted and open "control" area. We have been carrying out baseline monitoring of a number of the parameters described above and are eagerly anticipating the next field season to see if any changes are measurable.

Because of increased interest in restoring salt marshes impacted by tidal flow, we anticipate an increase in the number of salt marshes for which this kind of monitoring will need to be carried out. Eventually we hope that at least some of our monitoring methods could be carried out by citizen monitors who could track projects in their own region after receiving training in the methods. Over 600 students in the Great Marsh region are currently monitoring salt marsh vegetation, groundwater salinities, and fish under our Salt Marsh School Science Project. In addition to providing information on the status of their salt marshes and the success of any restoration efforts, citizen involvement is essential for creating a sense of stewardship toward our salt marshes.

Robert Buchsbaum
Massachusetts Audubon Society

JOIN THE MOVEMENT - BE A RESTORATION PARTNER

The Coordinating Committee of the Partnership To Restore Massachusetts Wetlands invites everyone with an interest in wetlands restoration to join the Partnership which is now over 200 strong.

PARTNERSHIP FORM

Name _____ Title _____ Affiliation _____

Address (Street/City/State/ZIP) _____ Phone () _____

I/we support the "Resolution to Restore Massachusetts Wetlands". Please include my (check one): ☐ agency ☐ organization ☐ self as a Partner in the Partnership to Restore Massachusetts Wetlands and put me on the mailing list to receive **Massachusetts Wetlands Restoration News**. I understand that this does not involve any commitment to a specific action or financial contribution. I/we will make implementation of the Partnership's Action Plan a priority and will do everything within my/our power to restore Massachusetts wetlands.

☐ Please send a copy of the Partnership's **Action Plan**.

Please return this form to:

Wetlands Restoration & Banking Program
Executive Office of Environmental Affairs
c/o DEP, One Winter Street - 5th Floor
Boston, MA 02108
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